

Oct. 15, 1957

G. L. ST. PIERRE ET AL

2,809,467

ARTICULATED TOY

Filed June 24, 1955

Fig. 1.

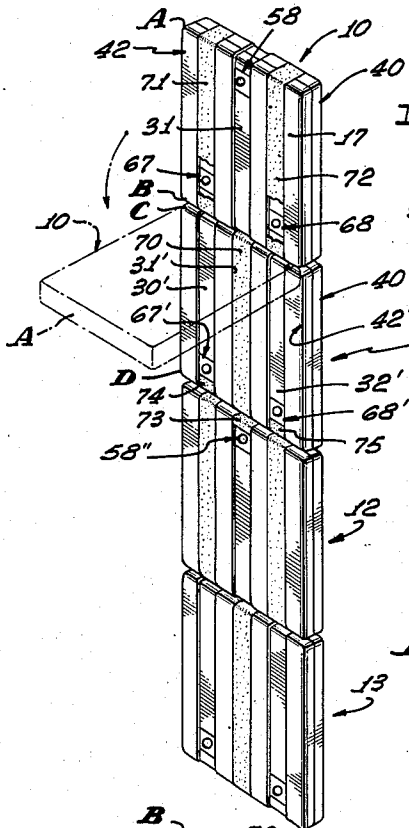


Fig. 2.

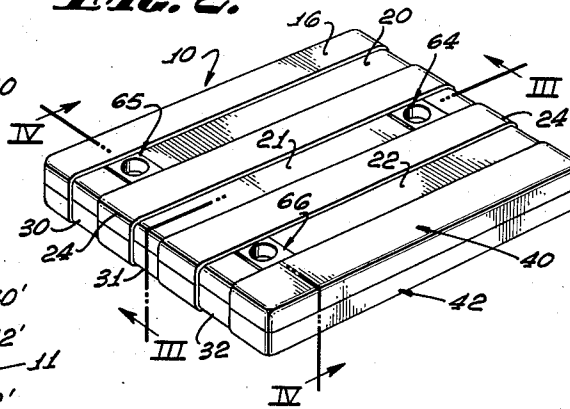


Fig. 3.

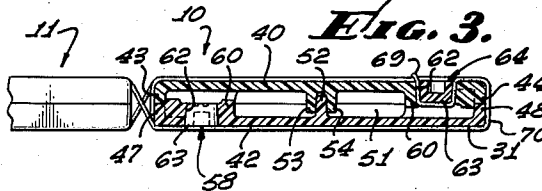


Fig. 4.

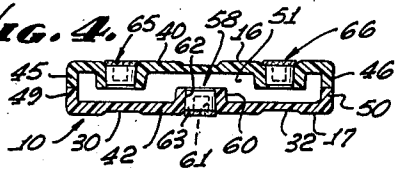


Fig. 6.

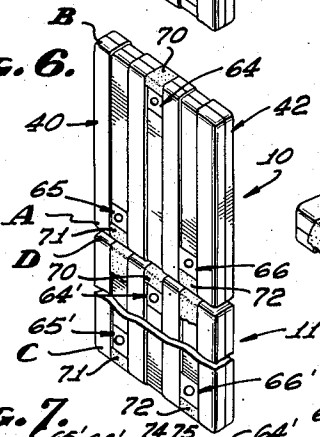


Fig. 5.

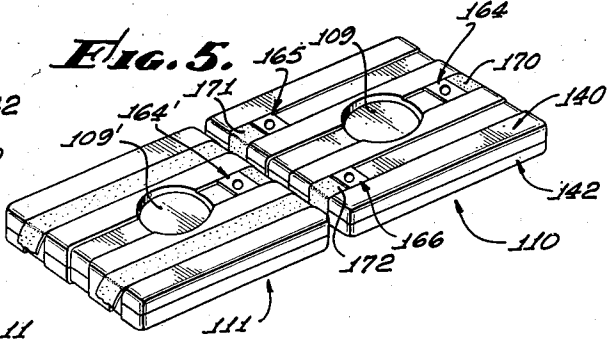
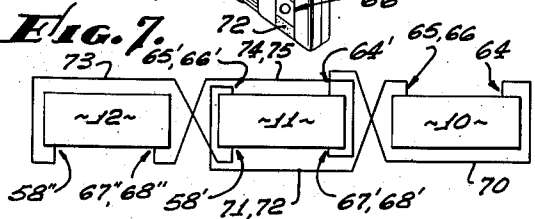


Fig. 7.



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1

2,809,467

ARTICULATED TOY

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Application June 24, 1955, Serial No. 517,762

3 Claims. (Cl. 46—1)

This invention relates generally to toys and amusement devices and particularly discloses an articulated plaything of novel construction whose component members are hingedly connected, each to adjacent members, by flexible bands or ribbons, the members themselves being desirably formed in rectangular parallelepipedon shape of hollow rigid material whereby to create a series of clacking noises during manipulation.

Our invention includes a plurality of virtually identical blocks having parallel rectangular faces. Preferably each block is made up of a pair of mating shell elements joined along their edges, and the blocks so fabricated are adapted to lie in end-to-end relationship when assembled with suitable connecting means. The blocks are provided with chamfered or rounded ends for reasons hereinafter pointed out, and the rectangular faces of the blocks, desirably include recessed grooves extending longitudinally of the blocks to house the flexible connecting bands and restrain such bands from slipping off the faces.

In a completed device made in accordance with the present invention there may be a series or set of four, five, six or more blocks arranged in successive end-to-end relation. Each interior block of such a series is hingedly connected to contiguous blocks by a plurality of flexible connecting members which may take the form of string, thin wire or the like but which we prefer to make of fabric ribbons or bands. These connecting members are attached to blocks adjacent the ends thereof, and the points of attachment are so disposed as to permit either end of any interior block to be hingedly abutted against an end of either block contiguous thereto. As a result of such construction, a set of blocks may be suspended from the uppermost block, and rotation of the latter through 180° about its horizontal transverse axis will cause each lower block, successively, to rotate similarly about its corresponding axis. A novel and amusing effect is thus produced by the noise of each block striking the next lower block and the effect is heightened when opposing faces of each block, and successive blocks, are differently colored. Functioning of the series of blocks as above described is facilitated and made more reliable when the blocks are constructed as herein shown and described, the end edges of the blocks being rounded off and longitudinal grooves or channels being provided in the rectangular faces to house and guide the connecting bands.

An object of the present invention is therefore to disclose a novel articulated toy.

Another object is to provide a toy having a plurality of rigid blocks interconnected by flexible members permitting each block to be hingedly connected to another block at either of its ends.

A further object is to provide an articulated toy having a plurality of hollow rigid blocks arranged to strike one another noisily during manipulation of the toy.

Another object is to disclose an articulated toy whose component blocks include means minimizing the possi-

2

bility of dislodgment of interconnecting bands from their blocks.

Another object is to disclose a toy having the above characteristics which is very inexpensive to manufacture.

5 These and other objects of the invention will become clear from a study of the following description of a preferred embodiment thereof taken in connection with the accompanying drawing in which:

10 Fig. 1 is a perspective view of a toy in accordance with our invention including four component blocks interconnected by flexible bands, the uppermost block in the series being shown in half rotated position in dotted outline.

Fig. 2 is a perspective view, on an enlarged scale, of 15 the half rotated block as seen in dotted outline in Fig. 1.

Fig. 3 is a sectional view taken upon line III—III of Fig. 2 and including a fragmentary portion of an adjacent hingedly connected block together with flexible interconnecting bands.

20 Fig. 4 is a sectional view taken on line IV—IV of Fig. 2.

Fig. 5 is a perspective view of a pair of hingedly connected contiguous blocks of slightly modified construction 25 together with portions of flexible bands for connection to a third block in the series.

Fig. 6 is a fragmentary perspective view of the upper portion of the toy shown in Fig. 1 after each block has been rotated about its horizontal transverse axis.

Fig. 7 is a diagrammatic representative of three suc- 30 cessive blocks in a series including, diagrammatically, the interconnecting flexible bands affording the hinged connection between contiguous blocks.

The completed toy shown in Fig. 1 includes a plurality of hingedly connected blocks indicated generally at 10, 35 11, 12 and 13. As will be understood, any number of blocks may be interconnected in tandem in accordance with our invention, the four blocks shown in Fig. 1 being illustrative only of a suitable number by which to practice the invention.

40 The uppermost block 10, in manipulating the toy, may be rotated downwardly about a horizontal transverse axis substantially coincident with the lower edge of the block, and in dotted outline in Fig. 1 is shown such uppermost block 10 half-way through its rotation. 45 In Fig. 2 the same block is shown on an enlarged scale, oriented as shown in dotted outline in Fig. 1, and includes a pair of substantially rectangular parallel faces, an upper face 16 and a lower face 17. Guide means are provided on the faces including parallel channels or grooves 20, 21 and 22 extending longitudinally of the upper face 16. The ends of the blocks are desirably somewhat rounded off as shown at 24 and the grooves 20, 21 and 22 continue around such ends. In this way the grooves 50 meet and register with similar guide means including longitudinal grooves 30, 31 and 32 formed in the bottom face of each block, these latter grooves being aligned with the grooves 20, 21 and 22 respectively and also extending around the curved ends of the block.

Each block may be fabricated of two interlocking block 60 elements as best seen in Figs. 3 and 4, an upper block element 40 and a lower block element 42. Each of the block elements is desirably made of a rigid plastic material or the like and upper block element 40 includes downwardly extending end flanges 43 and 44 and side flanges 45 and 46, the flanges being integrally formed and constituting a continuous peripheral lip. Similarly, 65 lower block element 42 includes upturned end flanges 47 and 48 and side flanges 49 and 50, these flanges also being integrally formed and constituting a continuous peripheral lip. When a block is assembled, its component block 70 elements 40 and 42 are arranged with their peripheral lips in abutting relation so that there is provided a hollow

space 51 between the two block elements. In order to insure that the two block elements of a block are in accurate alignment with each other when assembled, registering means are provided and in the present illustration take the form of an upstanding transverse rib 52 formed integrally with bottom block element 42, the transverse rib 52 being received in a transverse channel between a pair of spaced transverse ribs 53 and 54 formed integrally with upper block element 40. The ends of rib 52 may extend into abutting contact with side flanges 45 and 46 whereby to provide transverse as well as longitudinal alignment of the block elements. The block elements constituting the complete block 10 are desirably held in assembled relation by a suitable adhesive or cement along the abutting peripheral lips and transverse aligning ribs of the block elements.

Extending between adjacent successive blocks in a series there are flexible bands for affording hinged or foldable connection between the blocks, and anchoring means are provided for attaching the ends of such bands to spaced points on the faces of adjacent blocks. The anchoring means may assume any desired form suitable for the purpose, a preferred construction being indicated generally at 58 in Figs. 3 and 4. As there shown, anchoring means 58 includes an inwardly extending boss 60 formed in bottom block element 42, the boss 60 being provided with a tapered opening or recess 62 therein, and the recess may desirably be substantially rectangular in section. A locking element or plug 63, which may be made of the same rigid material as the block elements themselves, is received in the recess 62, the side walls of the plug being tapered to correspond with the tapered walls of recess 62. Suitable adhesive means or cement may be used to insure that plug 63 is retained in position in recess 62, and desirably plug 63 includes a cylindrical well 61 therein which serves both to facilitate handling of the plug in assembly as well as to afford a certain amount of resiliency to assist in gripping the side walls of recess 62. In the present illustrative embodiment of the invention there are six anchoring means similar to 58 in each block, the other such means in block 10 being indicated at 64, 65, 66, 67 and 68. As will be later understood, only three of these actually serve as anchors in block 10, since that block is an end block, the three operative anchor means being 64, 65 and 66. In Fig. 3 is shown the manner of attaching one end 69 of a flexible connecting band 70 to block 10 by means of anchor 64. It will be seen that the end portion 69 passes downwardly beneath the plug 63 and is gripped between the plug and the inner walls of the tapered recess 62. Band 70 then continues rightwardly from anchor means 64 and around the right end of block 10.

Further extent of band 70, as well as the disposition of other flexible bands constituting the hinge means between adjacent blocks in the set, will be best understood by reference to the diagram of Fig. 7. In that figure three blocks are shown, 10, 11 and 12, oriented as blocks 10 and 11 appear in Fig. 3. It is important to first note that when a set of blocks is in tandem relation as in Figs. 1, 3, 6 and 7, all blocks in the set are identically positioned from the standpoint of disposition of the anchor means thereon. Thus in Fig. 1, 58 designates the anchor means which is centrally disposed and adjacent the upper edge of block 10; the corresponding anchor means 58'' of block 12 is similarly disposed; likewise in the case of anchor means 67 and 68 of block 10 and 67' and 68' of block 11, these are the flanking anchor means adjacent the lower edges of the respective blocks. Furthermore, it is to be noted that each block element includes three anchor means in the present embodiment; two flanking anchors are adjacent one edge while the central anchor is adjacent the other edge. When the block elements are assembled to form a block, the flanking anchors of one block element are adjacent the same end of the assembled block

as the central anchor of the other block element, as is particularly brought out in Fig. 4.

Reference to Fig. 7 will make clear the system of interconnection of the several blocks in a set by means of flexible connecting members or bands. Three blocks, 10, 11 and 12, are shown, and it will be understood that as many more may be connected in tandem as desired. Flanking anchor means and their connecting bands are doubly designated in Fig. 7, since they are aligned with the reader's eye as there viewed. Connecting band 70, already referred to, extends from point 64 on block 10 to point 64' on block 11, these points being the anchor means or points of attachment previously designated. Bands 71 and 72 (compare Figs. 1 and 6) extend respectively between points 65 and 65' and points 66 and 66', the primed points corresponding, on block 11, to unprimed points on block 10. Band 73 extends between points 58' and 58'' of blocks 11 and 12 respectively. Bands 74 and 75 extend between points 67' and 67'' and points 68' and 68'' respectively.

Consider particularly the two contiguous blocks 10 and 11 and the bands interconnecting them. Band 70 extends from a point 64 on the upper face adjacent the distal end of block 10, around the distal edge of the block and longitudinally along the lower face. At the end of block 10 abutting block 11, band 70 extends between the abutting ends of the blocks and terminates at anchor point 64' on the upper face of block 11 adjacent the abutting end of block 11. Bands 71 and 72 extend from anchor points on the upper face of block 10 adjacent the abutting end thereof, thence between the abutting ends and longitudinally along the lower face of block 11, around the distal end thereof and terminate at anchor points on the upper face of block 11 adjacent the distal end thereof. It will be especially noted that all points of attachment, or anchor points, of the flexible connecting members are on the same faces of the two blocks, in this case the upper faces.

Considering the pair of contiguous blocks 11 and 12, it will be seen that the same principle governs the disposition of anchor points for their interconnecting flexible bands 73, 74 and 75, except that such points are all on the lower faces or bottoms of the two blocks, instead of the upper faces or tops as in the case of blocks 10 and 11 considered as a pair.

Consider now the pair of contiguous blocks 10 and 11 when in the position of Fig. 1, the upper block 10 being manually grasped. Let the ends of blocks 10 and 11 be designated A, B, C and D as shown, end A being the distal end of block 10 in the position of Fig. 1, B being its abutting end, C the abutting end of block 11 and D its distal end. Block 10 is now rotated downwardly about a horizontal transverse axis through abutting end B. The position of block 10 after 90° of such rotation is shown in dotted outline in Fig. 1. Continue the rotation so that the face of block element 42 approaches contact with the face of block element 42' of block 11. As such contact is made, block 10 is in the position shown in Fig. 6 and flexible bands 71 and 72 move from the recessed grooves or channels 30 and 32 (in which they have lain) into aligned channels 30' and 32' of block 11. Simultaneously band 70, which has been lying in channel 31' of block 11, moves into channel 31 of block 10. Under the influence of gravity block 11 may then rotate downwardly about a horizontal transverse axis along end D into the position shown in Fig. 6.

Thus the pair of blocks 10 and 11, originally hingedly connected at their ends B and C, are now hingedly connected along ends A and D, i. e. distal and abutting ends have become interchanged. As previously pointed out, a set or series of blocks constructed and interconnected in accordance with the present invention preferably includes four, five, six, or more blocks in tandem, end-to-end relation. In such a set, rotation of the uppermost block as described above initiates a series of rotations

of successive blocks since each interior block of a set is at once paired with the block above and the block below. Moreover, each time a face of one block comes into contact with a face of the next block in the series, a clattering noise results which is enhanced by the hollow construction of the blocks as previously described. Thus the movement of successive blocks presents a curious and amusing appearance accompanied by a certain amount of noise which children find refreshing.

A modified construction of the blocks is shown in Fig. 5, wherein reference characters are 100 greater than their corresponding counterparts in the figures heretofore described. The orientation of block 110 corresponds to that of block 10 in Fig. 2, and blocks 110 and 111 are hingedly interconnected in the same manner as heretofore described. Centrally disposed in each face of the blocks is a recessed well 109 of sufficient size to receive a coin such as a penny or a dime. As will be understood, well 109 and its contents are traversed by connecting band 170 at certain times and not at others in the operation of the present invention, a fact which gives rise to apparent legerdemain and other amusing effects.

It will be noted that the flexible bands providing the hinged connection between contiguous blocks in a series extend in all cases between two points similarly located on the blocks, and desirably such points are disposed adjacent an end of a block, as hereinabove described. Preferably the bands are made of fabric or similar flexible material having a minimum of stretch, and in assembly the device and the attachments of bands to anchor means are made while the bands are drawn tight. By this means the possibility of accidental dislodgment of a band from its correct path is minimized, and the longitudinal grooves or channels in the block faces contribute in retaining the bands in their correct positions. Although the flexible connecting members have been described herein as bands, and we prefer such construction, nevertheless they may take the form of any elongated flexible members which will stretch as little as possible in use.

The blocks may be made of polystyrene or similar material of substantially equivalent rigidity and strength. The plugs of the anchoring means are desirably made of the same material and plasticizer adhesive is used to retain the plugs in their recesses when assembled. The blocks may be of any desired size, and in order to further insure satisfactory operation and minimize dislodgment of a connecting band from its path, we prefer to make the length of each block between about five and ten times its thickness. The ends of the blocks are rounded as shown so that the abutting ends of adjacent blocks may remain in contact during hinging movement of one block relative to the other without permitting slack to form in the connecting bands.

Modifications and changes from the specific forms of the invention herein shown and described will occur to

those skilled in the art. All such modifications and changes not departing from the spirit of the invention are intended to be embraced by the appended claims.

We claim:

1. An articulated toy including a plurality of blocks in aligned end-to-end relation, each block having parallel ends and parallel substantially planar top and bottom faces and means hingedly connecting each block to an adjacent block, said connecting means including elongated flexible connecting members extending between the blocks of a contiguous pair, one said member being fixed at each of its ends to correspondingly disposed points on the upper faces of said contiguous blocks and extending longitudinally beneath one of the blocks, and another of said members being fixed at each of its ends to correspondingly disposed points on the upper faces of said contiguous blocks laterally spaced from the first named points and extending beneath the other block of said pair, said blocks being provided at said points with polygonal recesses formed therein having inwardly convergent flat side walls, end portions of the connecting members being disposed in juxtaposed relation with the recess side walls, and locking plugs in the recesses wedgingly retaining said end portions in the recesses, the plugs having open topped wells formed therein.

2. In an articulated toy comprising a plurality of blocks having parallel generally rectangular faces, each block being hingedly connected to an adjacent block by flexible bands whereby said blocks are arrangeable in extended end-to-end relation, the provision of: a block of thin-walled rigid material having spaced parallel generally rectangular faces provided with a plurality of shallow longitudinal channels and inwardly extending recesses formed in the channelled portions of the faces; laterally spaced flexible bands interconnecting adjacent blocks and receivable in said channels; and locking elements wedgingly receivable in said recesses, end portions of the bands being locked between said locking elements and side walls defining said recesses.

3. The invention as stated in claim 2 wherein said recesses are rectangular, and the recess side walls and locking element side walls are flat and taper inwardly.

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